

Evaluating Fitness for Duty for Respirators and Protective Clothing



Developed by
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Agenda

- Physiologic effects of wearing a respirator
- Medical evaluation logistics
- Preparing for the evaluation
- General principals of the evaluation
- Specific conditions that require further evaluation
- The role of additional tests
- Reporting to the employer
- Questions

Physiologic Effects of Respirator Components

Component	Stressor	Impact	Symptom
Mask/face piece	↑ Dead Space	<ul style="list-style-type: none"> ↑ C.V. Work ↑ CO₂ Retention 	<ul style="list-style-type: none"> • Angina, arrhythmia, CHF • Dyspnea
	• Facial Enclosure	<ul style="list-style-type: none"> • Impaired senses • limits eating, drinking, spitting • Dermal contact 	<ul style="list-style-type: none"> ↓ Awareness ↓ Ability to communicate • Claustrophobia • Hunger, thirst, hygiene • Skin irritation, Latex allergy
	• Thermal	• Heat stress	• Fatigue, mental

Physiologic Effects of Respirator Components (continued)

Component	Stressor	Impact	Symptom
Valves and filters	↑ Flow resistance	↑ C.V. Work ↑ CO ₂ Retention • Pneumothorax	• Angina, arrhythmia, CHF • Dyspnea • Pleuritic CP and dyspnea
Air Supply	Air pressure bias	↑ C.V. Work ↑ CO ₂ Retention	• Angina, arrhythmia, CHF • Dyspnea
	Thermal insulation	• Heat stress	• Fatigue, mental clouding • Dehydration
	Weight	↑ C.V. Work	• Angina, arrhythmia, CHF

Medical Evaluation

- Who can perform?
 - A physician or licensed health care provider (depending on scope of license)
- Who pays?
 - The employer
- What types of respirators?
 - All types except dust masks used on a voluntary basis
- What's required?
 - OSHA questionnaire or medical examination
- When?
 - **Prior** to fit testing and use of respirator in the workplace

Medical Evaluation

- When is follow-up required?
 - Yes, on questions 1-8, section 2, Part A, Appendix C CFR 1910.134
 - Yes, on questions 10-15 if wearing SCBA or full face respirator
 - If the employee reports symptoms
 - PLHCP, respiratory program administrator, or supervisor request
 - Info from the respiratory protection program suggests
 - Workplace conditions change
- Where does the exam take place?
 - At a place and time convenient for the employee

Age Based Evaluation Frequency

Age	Frequency	
	Light to Moderate Work	Strenuous work/ SCBA
<35	Every 5 Years	Every 3 Years
35-45	Every 2 Years	Every 18 Months
>45	Yearly	Yearly



Information the Employer Must Provide

- Type and weight of selected respirator
- Duration and frequency of use
- Expected work effort
- Additional clothing and equipment
- Temperature and humidity extremes
- Copy of written program and of CFR 1910.134



Additional Work Considerations

- Responsibility for the health and safety of others
- Dangerous work (high voltage, high places, machinery)
- Hazardous material
- Hazardous atmosphere (IDLH)
- Confined space



Evaluation: General Principals

- Purpose
 - provide reasonable assurance that employee can endure the stress of wearing respirator
 - Recommend limitations and accommodations
- Ability to endure stress is driven by cardiovascular, not pulmonary status

Focus of Medical Evaluation

- Previously diagnosed disease
 - Cardiovascular
 - Respiratory
 - Endocrine
 - Musculoskeletal
 - Neurologic
 - Psychologic

Focus of Medical Evaluation

- Problems with breathing during normal activities
- Past problems with respirator use
- Prior exposure to respiratory hazards
- Physical deformities or abnormalities
- Past and current usage of medication

Specific Conditions That Require Further Evaluation

- Tobacco use
- Neurologic
 - Sudden loss of consciousness (epilepsy, TIA)
 - Disturbances of vigilance (narcolepsy, sleep apnea, ADD)
 - Disturbances of posture, balance, and gait (Parkinsonism, multiple sclerosis, neuromuscular disease)



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Specific Conditions That Require Further Evaluation

- Endocrine
 - DM
 - Obesity
 - Heat intolerance
- Allergic conditions that interfere with breathing
 - Allergic rhinitis
 - Chronic sinusitis

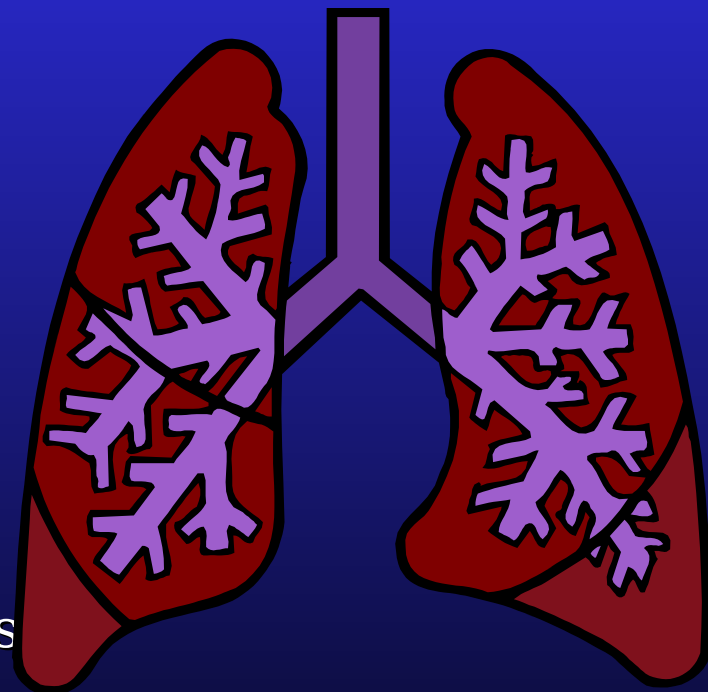
Specific Conditions That Require Further Evaluation

- Psychologic
 - Claustrophobia
 - Panic Disorder
 - Generalized Anxiety Disorder
 - Depression
 - Alcoholism/substance abuse
- Olfactory Disorders



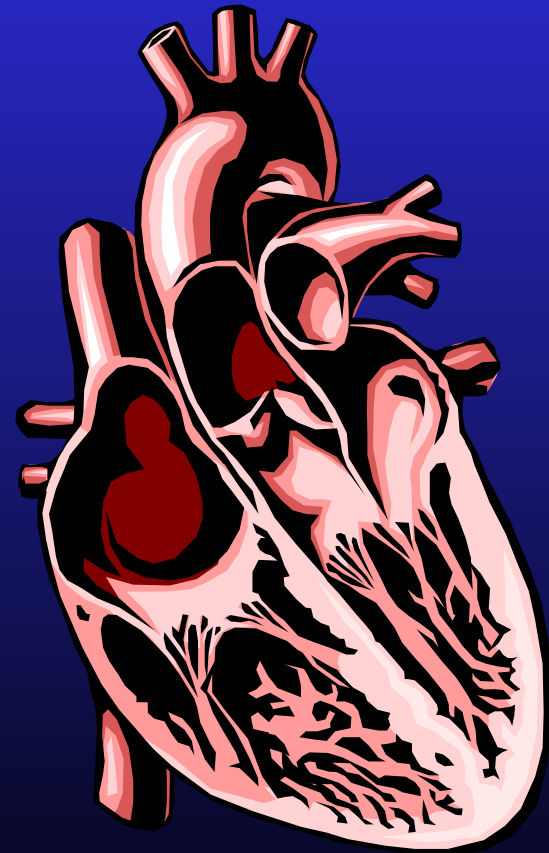
Specific Conditions That Require Further Evaluation

- Pulmonary
 - Asthma
 - COPD
 - Emphysema
 - Pneumothorax
 - Infection
 - Chronic respiratory symptoms
 - H/O thoracic surgery
 - H/O asbestosis or silicosis



Specific Conditions That Require Further Evaluation

- Cardiovascular
 - Hypertension
 - Arrhythmia
 - ASCAD
 - CHF
 - Valvular disease
 - Stroke



Specific Conditions That Require Further Evaluation

- Medications
 - Insulin
 - Oral hypoglycemics
 - Beta blockers
 - Peripheral vasodilators
 - Anti seizure medications
 - Antihistamines and Anticholinergics
 - Diuretics
- History of problems wearing a respirator

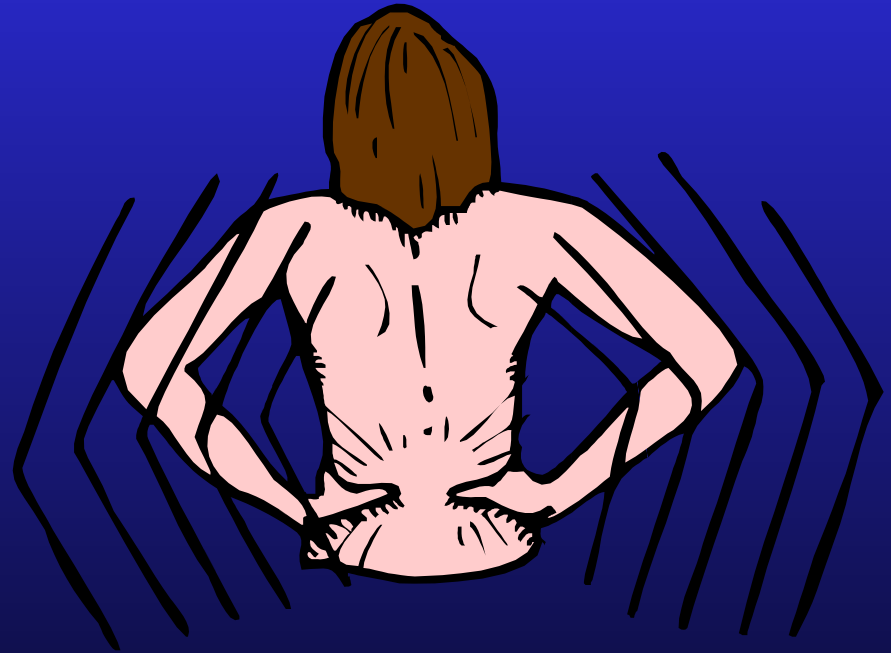


Conditions That Require Further Evaluation before Using SCBA and Full Face Respirators

- Disorders of the special senses
 - Auditory
 - » Rupture tympanic membrane
 - » Hearing loss
 - Vision
 - » Transient or permanent blindness in either eye
 - » Color blindness
 - » Diminished visual acuity

Conditions That Require Further Evaluation before Using SCBA and Full Face Respirators

- Musculoskeletal
 - Cervical radiculopathy
 - Low back pain
 - Joint problems that impair mobility/coordination



Other Conditions That May Require Evaluation

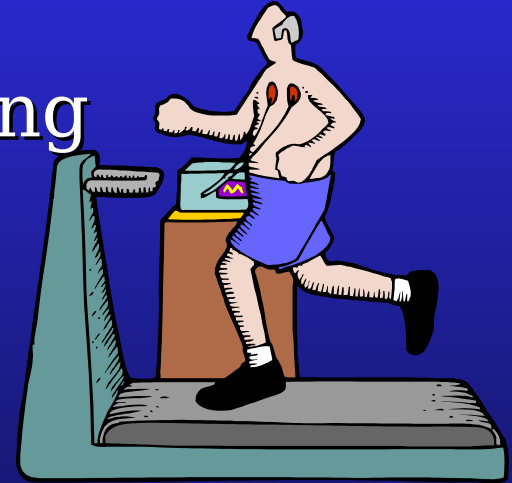
- Dermatologic
 - Latex allergy
 - Impairment of sweating mechanisms
 - Pseudofolliculitis Barbea
 - Facial scarring



Additional Tests

Exercise Stress Test (EST)

- Not used for routine screening of asymptomatic workers
- Indications:
 - Known disease
 - > 2 risk factors (or a single extreme risk factor)
 - Abnormal pulmonary function test
 - SCBA use in strenuous conditions
 - statutory requirement



Exercise Stress Test (EST)

- Helps characterize cardiopulmonary reserve
 - If patient is symptomatic or has > 2 risk factors
 - » $> \text{or } = 10$ METS and negative test = low risk of future event
 - » $< \text{or } = 6$ METS and positive test = high risk of future event
 - » $6 - 10$ METS = limited predictive value

Pulmonary Function Test (PFT)

- Not routinely required
- Indications (American Thoracic Society)
 - Over age 45 + SCBA + strenuous exertion
 - Under age 45 + SCBA + strenuous exertion and reported symptoms or abnormalities on screening questionnaire
 - All users > age 55
 - Workers reporting respiratory symptoms at the level of exertion required for their job
- Absent other limiting factors, FVC or FEV₁ >60% of predicted sufficient for trial of respirator use
 - Remember to adjust for race

Miscellaneous

- ECG
 - Minimal predictive value for screening healthy workers
 - Stratifying by pre-test probability of CAD increases yield
 - May be required by statute
- Chest X-Ray
 - Minimal predictive value for screening
 - May be obtained for surveillance or diagnostic evaluation
- Olfactory
 - Indication depends on chemicals present in workplace and type of respirator

What Is Reported to the Employer?

- Medical Determination
 - Whether or not the employee is medically able to use a respirator
 - Any limitations
 - The need, if any, for follow-up
 - Statement that the employee has received a copy of the determination

Questions



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